EXHIBIT 16

Shah, D.M.(Dipak)

From: Stockman, Tom J
Sent: Monday, September 25, 2000 1:18 PM
To: Shah, D.M.(Dipak)
Subject: Re: Post-MTBE production : Send all isobutylene to Alky 2

William D Sleeper
09/20/2000 01:52 PM

To: Tom J Stockman/Beaumont/Mobil-Notes@Mobil
cc: Fabian V Gabrysch/Beaumont/Mobil-Notes@Mobil, Dolye E Erickson/Beaumont/Mobil-Notes@Mobil
Subject: Post-MTBE production : Send all isobutylene to Alky 2

Tom,

As discussed during the FCC YES study and subsequent evaluations, here's a rough summary of the requirements to revamp Alky 2 to process all the isobutylene currently converted into MTBE in addition to the planned "Increase Alky 2 refrigeration" and "Add additional reactor" projects :

Assumptions :

Base rate	15,500 KBD
Expansion	6,800 KBD
Future	22,300 KBD

Scope :

Add additional 6000 B/D Exxon Autorefrigerated Unit
Add new 3500 hp motor driven compressor plus vapor line to compressors
Add ~35 MMBTU/hr worth of cooling by air coolers for new refrigeration compressor plus foundation / structure
Revamp the MTBE D1 tower to be a deisobutanizer
Possibly convert D103 or new tower for additional DeBut capacity or D1 sidedraw for nC4 (with product / IC4 recycle pumps)
Possibly add additional coalescer / caustic scrubber / water wash
Replace olefin feed pumps
Replace isobutane from field pumps
Add additional DeBut bottoms pump
Replace effluent pumps
Replace DIB feed pumps
Replace refrigeration recycle pumps
Possibly increase feed / effluent surface area or refrigeration receiver / effluent area
Increase tankage for fresh and spent acid plus line capacity between refinery and Arch chemical
Replace relief valves / control valves as required
Increase capacity of blowdown system, blowdown drum, offgas scrubber, degasser and associated pumps
Power / Substation to provide incremental power requirements for compressor and pumps listed above

Madden
Exhibit No. 28
8.22.07 C. PERKS

BM Alky
= 15.5 → 21

25 M for Alky expansion
(Needs definition)

3 M Going forward ~~R~~ Refrigeration } Acid saving
8 M - Not sure - Reactor } octane Improvement

PMI → 1 wt% O_2 gasoline - Mexico

chemicals

- 500 M lb $iC_4^=$ goes to Butyl rubber in US (Exxon)
- 30 ¢/lb or 68 $/B

RVP differences

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XOM-MDL1358hExxonDTU-0037914

PIMS MODEL SOLUTION SUMMARY REPORT
ExxonMobil Beaumont Refinery
MODEL: MTBEPHASEOUT Study
2000 CoPlan Prices for 2004

	2005 w LSM Project Facilities	O2 Mandate, MTBE Banned	Sell Refinery MTBE	Build IsoOctene Unit	Alky Expansion	No O2 Mandate, MTBE Allowed	No O2 Mandate, MTBE Banned	Build IsoOctene Unit	Alky Expansion
O2 MANDATE	YES	YES	YES	YES	YES	NO	NO	NO	NO
MTBE USED	YES	NO	NO	NO	NO	YES	NO	NO	NO
ETHANOL USED	NO	YES	YES	YES	YES	NO	YES	YES	YES
MTBE PLANT CONVERTED	NO	NO	NO	YES	NO	NO	NO	YES	NO
CASE NO:	1.0	2.0	3.0	4.0	5.0	7.0	9.0	10.0	11.0
OBJ FUNC, kS/D	4527.5	4445.8	4512.2	4493.8	4484.4	4528.6	4439.1	4492.1	4482.0
OBJ FUNC, M$/Yr	1652.5	1622.7	1647.0	1640.2	1636.8	1652.9	1620.3	1639.6	1635.9
Delta OBJ FUNC, M$/Yr	BASE	-29.8							
Delta OBJ FUNC, M$/Yr		Base		17.5					
Delta OBJ FUNC, M$/Yr		Base			14.1				
Delta OBJ FUNC, M$/Yr							Base	19.3	
Delta OBJ FUNC, M$/Yr							Base		15.6
Refy MTBE BEV($/Bbl)			8.9						
Crude/Cat Rates									
Total Crude	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4
FCC	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
MTBE(Pure)	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0
Iso-Octene	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Alky	15.5	15.5	15.5	14.9	21.3	15.5	15.5	14.6	21.3
Gasolines Sold									
Conv NE SUL (9 #)	61.2	13.8	34.2	32.6	25.5	55.8	7.0	28.9	20.8
Conv SW SUL(7.8 #)	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL (9 #)	43.2	94.9	77.9	83.9	95.3	47.1	99.0	86.4	99.4
Conv SW RUL(7.8 #)	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Total Conventional	161.6	165.8	169.3	173.6	178.0	160.1	163.2	172.5	177.4
Relm SW SUL	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Relm SW RUL	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Total RFG	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
TOTAL MOGAS	201.6	205.8 why	209.3	213.6	218.0	200.1	203.2	212.5	217.4
% Super	50.1%	26.0%	35.3%	33.8%	29.9%	47.7%	23.0%	32.3%	27.8%
IC4= to Fuel		1.0					0.9		
IC4 Sales	11.3	10.4	11.3	12.6	8.7	11.3	10.3	12.5	8.7
Sulfuric Acid, ST/D	160	160	160	174	221	160	160	170	221
FEEDSTOCK PURCHASES									
Cusiana - 4320954	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2
Maya 4321133	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5
Oso 4920166	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Olmeca 4018951	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7
Nat Gasoline from WT	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
MCC B=B Mix	0.8	0.0	0.8	0.8	0.8	0.8	0.0	0.8	0.8
Wharf Natural Gasol	1.2	2.1	12.0	12.6	12.7	1.4	1.3	12.6	12.7
Methanol	1.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0
Ethanol	0.0	2.6	2.8	2.6	2.6	0.0	1.7	2.1	1.9
MTBE	5.3	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0
Purchased Pygas	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Iso-Octene	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Purchased Hvy Naphth	2.5	9.1	6.2	4.5	4.3	2.5	7.7	4.8	4.3
Purchased VGO	30.8	30.4	30.0	18.6	15.3	30.8	30.4	22.7	15.5
UTILITY PURCHASES									
Hydrogen (HI) from A	22.0	20.2	21.2	15.4	13.8	21.9	21.6	17.7	14.0
Fuel Gas foeb	23.4	22.6	23.9	23.9	23.8	23.4	22.5	23.8	23.8
Power kwh	112.4	111.3	116.4	127.7	113.6	112.5	108.8	128.1	113.6
Cat/Chem US $	53.1	52.3	53.1	51.2	51.4	53.1	52.3	51.6	51.4
ZSM-5 US $/o	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FCC Cat US $/on	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk Acid ton	160	160	160	174	221	160	160	170	221
G&D Addl US $	9.3	9.6	9.6	9.2	9.0	9.3	9.5	9.3	9.0
PRODUCT SALES									
Conv NE SUL	61.2	13.8	34.2	32.6	25.5	55.8	7.0	28.9	20.8
Conv SW SUL	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL	43.2	94.9	77.9	83.9	95.3	47.1	99.0	86.4	99.4
Conv SW RUL	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Relm SW SUL	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Relm SW RUL	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

Refinery MTBE	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0
Benzene	14.2	12.2	12.7	12.8	12.7	14.2	12.1	12.8	12.7
Mixed Xylenes	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Paraxylene	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
MJA Jet	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Military Jet JP-8	22.2	23.2	22.8	22.5	22.5	22.2	23.0	22.6	22.5
Ultra LS Diesel	21.4	21.4	20.5	7.5	3.7	21.4	21.4	12.1	3.9
Light Cycle Oil	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Lubes	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Waxes	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Low Sulfur No6 (CUA)	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8
Slurry Oil	6.9	7.1	6.8	5.2	4.7	6.9	7.1	5.8	4.7
Pet Coke High Sulfur	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
P-P Mix(65 %)	17.8	17.8	17.8	17.5	17.4	17.8	17.8	17.6	17.4
Propane	14.4	14.0	14.4	14.6	14.7	14.4	14.0	14.5	14.7
I-Butane	11.3	10.4	11.3	12.6	8.7	11.3	10.3	12.5	8.7
N-Butane	18.8	19.1	19.6	20.0	19.8	19.0	19.0	19.8	19.7
Fuel Gas	7.6	8.0	7.5	7.6	7.5	7.6	7.9	7.5	7.5
Net Offgas MCC, FOEB	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Cat Coke, 5 M	4.8	4.8	4.8	4.7	4.7	4.8	4.8	4.7	4.7
Sulfur, 3.19 M	1.6	1.6	1.6	1.5	1.5	1.6	1.6	1.5	1.5

CAPACITY UTILIZATION
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Crude Unit A	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7
Crude Unit B	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7
Isom Prtr	24.3	25.5	35.3	35.8	35.8	24.5	24.6	35.7	35.9
Isom Reactor	13.4	13.8	16.2	16.3	16.3	13.5	13.6	16.3	16.3
Deisohexanizer	36.3	31.7	36.5	36.5	36.4	36.4	32.6	36.5	36.4
Prtr-3	47.4	49.1	49.1	48.8	48.6	47.4	49.1	49.0	48.6
CCR-3	75.0	75.0	75.0	75.0	75.0	75.0	73.8	75.0	75.0
Prtr-4	56.2	58.3	55.4	55.7	55.9	56.2	57.3	55.4	55.9
CCR-4	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
Udex	25.5	24.1	24.2	24.1	24.0	25.5	24.0	24.0	23.9
Toluene Recvy Cap	0.3	0.9	0.8	0.8	0.8	0.3	0.9	0.8	0.8
Benzene Recvy Cap	7.7	5.7	6.2	6.3	6.3	7.7	5.7	6.3	6.3
Udex Raffinate Cap	17.5	17.5	17.1	17.0	16.9	17.5	17.5	16.9	16.9
Benz + Toluene	8.0	6.6	7.1	7.1	7.1	8.0	6.5	7.1	7.0
Pygas Hydrotreater	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Paraxylene Cap	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Hvy Ref Splitter	26.3	32.0	28.3	29.0	30.5	26.3	32.0	30.1	31.1
Mixed Xylene Recy	11.3	11.3	11.1	11.0	11.0	11.3	11.1	10.9	10.9
Rerun Twr Ovhd	1.6	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4
Rerun Twr Btms	9.7	9.9	9.7	9.6	9.6	9.7	9.7	9.6	9.6
No. 1 Debut Ovhd	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Bender (Trtr-3)	22.2	23.2	22.8	22.5	22.5	22.2	23.0	22.6	22.5
CHD-1 Kero	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Eff. CHD-1	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
CHD-2 LSD	21.6	21.6	20.8	7.6	3.7	21.6	21.5	12.3	3.9
HDF	25.3	26.6	26.6	26.6	26.6	25.3	26.6	26.6	26.6
CHD-2 Splitter Tower	25.7	27.0	27.0	27.0	27.0	25.7	26.9	27.0	27.0
Eff CHD-2	47.3	48.7	47.8	34.6	30.7	47.3	48.6	39.3	31.0
FCCU	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
Wet Gas Cap(MSCF/D	78.3	78.2	78.4	79.8	80.2	78.3	78.2	79.3	80.1
High Pressure Cap(	60.8	60.9	60.9	61.2	61.3	60.8	60.9	61.1	61.3
SOX, lbs/hr	3.5	3.6	3.5	3.4	3.3	3.5	3.6	3.4	3.3
Cat Coke, mlbs/h	79.2	79.4	79.2	78.2	77.9	79.2	79.4	78.5	77.9
FCC Burn Air, mscf	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0
FCC Gasoline Split	53.2	52.8	53.4	55.5	56.1	53.2	52.6	54.7	56.0
GP5W PP Recovery	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Alkylate	15.5	15.5	15.5	14.9	21.3	15.5	15.5	14.6	21.3
MTBE	3.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	0.0
Iso-Octene Unit	0.0	0.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0
Hydrocracker	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
HDC Hyd Makeup	195.3	192.5	195.0	190.4	189.0	195.3	192.5	192.0	189.1
HDC Gasoline Draw	11.2	18.0	18.0	18.0	18.0	11.3	18.0	18.0	18.0
HDC Lt Naphtha Dra	31.0	25.9	25.9	25.5	25.3	30.9	27.2	25.8	25.3
HDC Kero Draw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coker	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
Coke, tons	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Duosol	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Furfural Units	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Ketone One	2.9	2.9	2.9	2.9	2.9	3.5	2.9	2.9	3.5
Ketone Two	10.7	10.7	10.7	10.7	10.7	10.1	10.7	10.7	10.1
H2 Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold Box(MMSCFD)	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
Sulfur Plant	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

ECONOMIC SUMMARY ANALYSIS
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PRODUCT SALES	9457.7	9396.1	9630.1	9355.6	9283.2	9419.3	9320.6	9420.9	9265.2
FEEDSTOCK PURCHASES	4438.9	4474.0	4620.1	4375.8	4314.9	4399.3	4403.9	4439.0	4299.0
GROSS MARGIN	5018.8	4922.2	5010.0	4979.8	4968.3	5020.0	4916.7	4981.9	4966.2
NET UTILITY COSTS	491.3	476.3	497.8	486.0	483.8	491.4	477.5	489.8	484.2
NET OPERATING MARGIN	4527.5	4445.8	4512.2	4493.8	4484.4	4528.6	4439.1	4492.1	4482.0

MTBE Phaseout Study

Introduction

Legislation has been proposed to eliminate MTBE from the US gasoline pool due to its toxicity and recent evidence of MTBE contamination of groundwater. An LP study was conducted to determine the impact of such legislation on the Beaumont refinery and evaluate several options for handling the displaced refinery Isobutylene. The Beaumont Low Sulfur Mogas project facilities were assumed to be operational for this study.

Conclusions

When MTBE is eliminated from the US gasoline pool the three most attractive options for handling the excess Isobutylene are:

1) Continued production of MTBE and sales to the chemical market for Isobutylene production.
2) Conversion of the refinery MTBE unit to the Isooctene process.
3) Expansion of the refinery alkylation unit.

Continued operation of the refinery MTBE unit with sales to the chemicals market as Isobutylene feedstock may be competitive with alternate supplies of Isobutylene feedstocks. The BEV(break even value) of Refinery MTBE was calculated at $13/Bbl. At this value we may be able to displace marginal 'last barrels' that feed the Isobutylene market. Chemical is pursing this option. Baytown MTBE barrels will be the first placed into the chemicals market due to purity and logistics.

The additional capital costs and lower revenue associated with an alky expansion makes it unattractive when compared to converting the MTBE unit to the Isooctene process.

There is no economic incentive to remove MTBE from gasoline production earlier than mandated by law. The margin impact for phasing out MTBE early is estimated at $25M/YR. This does not reflect any market impact for loss of super or total gasoline production associated with removing 200 KBD of a high-octane gasoline blendstock.

When MTBE is eliminated from our gasoline pool the driveability specification will become the limiting specification for production of summertime 7.8/9.0 # Super. Our ability to economically produce 7.8/9.0 # super will be reduced to 50-60 KBD unless a high octane, low distillation component can be found to replace MTBE in our gasoline pool.

The blend value of Isooctene is calculated at $29.6/Bbl. This is significantly above its octane/RVP blend value of $25.2/Bbl. The difference is due to its advantageous sulfur and distillation properties.

Discussion

The Beaumont refinery currently produces approximately 3 KBD of MTBE as a refinery gasoline blendstock. This volume of MTBE is usually supplemented with outside

purchases to produce reformulated gasoline and relieve distillation constraints in conventional gasoline.

Elimination of refinery produced MTBE would orphan approximately 2,400 bpd of isobutylene. With the existing refinery hardware this material would have to be blended into gasoline, processed on the alkylation unit or put to fuel. The economic penalty for eliminating MTBE production from the Beaumont refinery is estimated at \$25M/Yr.

The two most attractive options for handling the orphaned isobutylene are conversion of our MTBE unit to the Isooctene process or expanding our existing alkylation unit. A comparison of the two processes indicates that the alkylation process gives a higher total gasoline yield but a lower yield of super. This can be explained by the chemistry of the two processes. The alkylation process yields 1.76 barrels of gasoline blendstock per barrel of c4 olefin with a corresponding 1.12 barrel loss in isobutane. The Isooctene process yields 0.81 barrels of gasoline blendstock per barrel of c4 olefin. A comparison of the octane values for alkylate and isooctene explains the increased super production associated with the isooctene process. Isooctene has a road octane blending value of 100 compared to a C4 alkylate from isobutylene road octane blend value of 91. As such the economics between these two processes are sensitive to the value of octane as well as the differential between isobutane and gasoline. 2000 P & B Plan pricing for 2004 generates \$3.5 M/Yr of additional credits for the Isooctene process versus alkylation. These credits are achievable with or without the Oxygen Mandate in place.

An alky expansion to handle the volume of Isobutylene currently processed on the MTBE unit would require modification of every major circuit of the unit. The feed and product systems, reactors, heat exchangers, refrigeration and fractionation systems as well as support systems such as tankage, relief, blowdown, electrical, and cooling water systems would all require modification. This type of expansion would be significantly more expensive than converting the MTBE unit to Isooctene production.

The additional capital costs and lower revenue associated with an alky expansion makes it unattractive when compared to converting the MTBE unit to the Isooctene process.

At the Beaumont refinery MTBE is primarily used to meet the oxygen requirement for reformulated gasoline. Its high-octane value also makes it a good blendstock for increasing super production or overcoming operational problems at the reformers. However it has other attractive properties that cause us to blend it into conventional gasoline.

With our world scale reformers reformate makes up a large percentage of our gasoline pool. This is good from an octane, RVP and sulfur perspective. However reformate is a relatively heavy (250+ 50 % pt) gasoline blendstock. During the summer the driveability specification limts how effectively we can utilize our large refomers.

One of the other attractive properties of MTBE is its low boiling point (131 F). This makes MTBE a great component for controlling driveability as well as endpoint and t-50 in our summer conventional gasoline.

Post the Low Sulfur Mogas Project Beaumont is projected to have the capability to produce 90-100 KBD of super. If MTBE is banned from gasoline the Beaumont refinery's

ability to economically produce super in the summer will be reduced to 50-60 KBD. Approximately 15 KBD of this reduction is due to the loss in octane of MTBE. The remaining 25 KBD is due to MTBE's impact on driveability.

When MTBE is removed from the summer Beaumont gasoline pool the marginal value of driveability(DRI) increases from $0.002/DRI to $0.042/DRI. The result is a huge increase in value of gasoline components with a low DRI blend value. For example udex raffinate has a DRI blend value of 964 compared to MTBE at 880, reformate at 1570 and a spec of 1250. When MTBE is removed the blend value of udex raffinate increases by $3/Bbl.

The economics of octane shift away from making super to upgrading low octane blendstocks such as C6+ and HDC gasoline/lt naphtha to gasoline. This is due to the limited amount of reformate that can fit into a blend of 7.8/9.0 # super.

There are several options available to the Beaumont refinery to relieve the DRI constraint if MTBE is banned from gasoline. The Low Sulfur Mogas project currently combines the FCC gasoline splitter overhead stream with the HDF gasoline product. Segregating these two streams would allow us to take advantage of the low boiling point characteristics of the splitter overhead stream. Unfortunately its octane value (87.7 Road) and sulfur content will limit its use in super.

Another option is to modify the DIH operation to increase IC6 recovery at the expense of NC6 upgrading on the reformer. With the gasoline blending constraints shifting from octane to distillation this option has some merit however the volumes are small enough that this change will not relieve DRI constraints completely.

Convertion of the existing Isomerization unit from C5 to C5/C6 isomerization is another option. This would require significant capital and have process debits associated with lower natural gasoline throughputs. However the octane and distillation credits from converting NC6 to DMB may offset the loss in natural gasoline uplift.

The 2000 P & B Plan pricing had a 1.8 cpg premium on RFG gasoline versus conventional. At that differential there is an incentive to maximize RFG production to approximately 60 KBD. The volume of economical RFG production is limited by the ability of the conventional gasoline pool to absorb reformate and still meet the DRI specification. The driveability spec forces the economics of octane to shift from super production to upgrading low octane blendstocks. This is evidenced by the large incentive to increase RFG regular($1.6/Bbl).

These economics of octane are independent of which oxygenate is used. When MTBE is removed and ethanol is used to meet the oxygen requirement for RFG only RFG regular is economical at a 1.8 cpg premium over conventional. There is a large incentive ($1.9/Bbl) to lower RFG Super production and a $0.60/Bbl incentive to increase RFG regular. This is due to the limited amount of oxygen that the market will reward us for. That is the market will pay a premium for RFG but the Oxygen specification limits how much oxygenate we can add. When the ethanol content is raised to 7.7 or 10 wt % we hit toxics emissions limits.

If the Oxygen Mandate is dropped altogether the economics of RFG production do not change significantly. The preferred use for octane is still upgrading light, low DRI

blendstocks to gasoline. Unfortunately for Beaumont most of these are low octane such as C6+ or HDC gasoline/lt naphtha. With the loss of the low boiling point oxygenates the ability to economically produce super drops to 70 KBD.

PIMS MODEL SOLUTION SUMMARY REPORT
ExxonMobil Beaumont Refinery
MODEL: MTBEPHASEOUT Study
2000 CoPlan Prices for 2004

Price? 9. 9

	2005 w LSM Project Facilities	O2 Mandate, MTBE Banned	Sell Refinery MTBE	Build IsoOctene Unit	Alky Expansion	Iso-Octene Blend Value	No O2 Mandate, MTBE Allowed	No O2 Mandate, MTBE Banned	Build IsoOctene Unit	Alky Expansion	Iso-Octene Blend Value - No O2 Mandate	No Oxygen Mandate, No MTBE or Ethanol Blended
O2 MANDATE	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO
MTBE USED	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO
ETHANOL USED	NO	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	NO
MTBE PLANT CONVERTED	NO	NO	NO	YES	NO	NO yes	NO	NO	YES	NO	NO yes	NO
CASE NO:	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	14.0
OBJ FUNC, K$/D	4531.5	4459.0	4504.9	4500.8	4482.6	4478.7	4532.8	4459.2	4501.1	4491.8	4479.0	4519.8
OBJ FUNC, M$/Yr	1654.0	1627.5	1644.3	1642.8	1639.8	1634.7	1654.4	1627.6	1642.9	1639.5	1634.8	1649.7
Delta OBJ FUNC, M$/Yr	BASE	-26.4										
Delta OBJ FUNC, M$/Yr		Base		15.2								
Delta OBJ FUNC, M$/Yr		Base			12.3							
Delta OBJ FUNC, M$/Yr								Base	15.3			
Delta OBJ FUNC, M$/Yr								Base		11.9		
Refy MTBE BEV($/Bbl)			13.3									
IsoOctene BEV($/Bbl)						29.6					29.6	
RFG Incentive($/Bbl) Super		-1.90	-0.70	-1.20	-0.85		0.03	-1.25	-0.10	-1.00		
RFG Incentive($/Bbl) Regular	1.60	0.40	0.30	1.10	0.80	0.80	1.70	0.15	1.80	2.30	2.00	2.30

Crude/Cat Rates

Total Crude	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4
FCC	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
MTBE(Pure)	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0
Iso-Octene	0.0	0.0	0.0	2.9	0.0	2.9	0.0	0.0	2.9	0.0	2.9	0.0
Alky	15.4	15.5	15.4	14.0	19.7	14.0	15.3	15.5	14.0	19.7	14.0	15.4

Gasolines Sold

Conv NE SUL (9 #)	69.1	13.9	19.1	34.6	28.3	58.4	68.1	13.6	34.3	29.3	56.2	55.6
Conv SW SUL(7.8 #)	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL (9 #)	20.6	97.3	88.7	75.8	88.0	52.2	20.0	97.9	76.0	83.7	52.8	68.3
Conv SW RUL(7.8 #)	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	47.5	42.5	42.5
Total Conventional	146.8	168.3	165.0	167.6	171.5	187.8	145.3	168.0	167.5	170.2	166.2	181.0
Refm SW SUL	37.2	25.0	25.0	25.0	25.0	25.1	37.5	25.0	25.0	25.0	26.4	0.4
Refm SW RUL	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Total RFG	59.7	47.5	47.5	47.5	47.5	47.6	60.0	47.5	47.5	47.5	48.9	22.9
TOTAL MOGAS	206.5	215.8	212.5	215.1	219.0	215.3	205.3	216.1	215.0	217.7	215.0	204.0
% Super	58.6%	24.8%	27.7%	34.5%	31.0%	45.6%	58.6%	24.6%	34.4%	31.7%	45.2%	34.7%
IC4= to Fuel		1.4				1.2		1.4			1.3	
IC4 Sales	11.3	10.6	11.1	12.0	8.3	12.2	11.2	10.6	12.0	8.3	12.2	11.3
Sulfuric Acid, ST/D	160	161	160	163	204	163	158	161	163	204	163	160

FEEDSTOCK PURCHASES

Cusiana - 4320954	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2
Maya 4321133	108.5	108.5	100.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5
Oso 4820168	70.0	70.0	70.0	70.0	70.0	70.6	70.0	70.0	70.0	70.0	70.0	70.0
Olmeca 4018951	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7
Nat Gasoline from WT	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
MCC B=B Mix	0.8	0.0	0.8	0.8	0.8	0.8	0.8	0.0	0.8	0.8	0.8	0.8
Wharf Natural Gasol	0.0	12.1	11.9	12.1	12.2	12.4	0.2	12.0	12.2	11.4	12.3	12.3
Methanol	1.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	1.0
Ethanol	0.0	2.6	2.8	2.6	2.6	2.6	0.0	2.5	2.5	2.6	2.4	0.0
MTBE	11.1	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0
Purchased Pygas	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	7.0
Iso-Octene	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	5.0	0.0
Purchased Hvy Naphth	2.8	9.0	8.6	7.8	7.9	4.3	3.2	9.5	7.8	6.9	4.3	2.9
Purchased VGO	30.8	30.4	30.8	30.8	30.8	30.8	29.9	30.4	30.8	30.8	30.8	30.8

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UTILITY PURCHASES

Hydrogen (H2) from A	22.0	23.5	22.0	23.7	24.8	21.8	18.5	23.1	23.5	25.7	21.8	21.8
Fuel Gas foeb	23.3	22.6	24.1	23.9	23.7	23.7	23.3	22.8	23.9	23.7	23.7	23.8
Power kwh	111.7	109.1	116.9	126.0	111.6	129.1	111.4	109.7	126.1	110.7	129.1	112.0
Cat/Chem US $	53.0	52.3	53.2	52.3	52.8	52.4	53.0	52.3	52.3	52.7	52.4	53.1
ZSM-5 US $/to	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FCC Cat US $/ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk Acid ton	160	161	160	163	204	163	158	161	163	204	163	160
G&D Add US $	9.4	9.8	9.8	9.8	9.8	9.7	9.4	9.8	9.8	9.7	9.7	9.4

PRODUCT SALES

Conv NE SUL	69.1	13.9	19.1	34.6	28.3	58.4	68.1	13.6	34.3	29.3	56.2	55.6
Conv SW SUL	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL	20.6	97.3	88.7	75.8	86.0	52.2	20.0	97.9	76.0	83.7	52.8	68.3
Conv SW RUL	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Refm SW SUL	37.2	25.0	25.0	25.0	25.0	25.1	37.5	25.0	25.0	25.0	20.4	0.4
Refm SW RUL	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Refinery MTBE	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6
Benzene	14.1	11.6	11.1	12.0	11.8	12.8	14.2	11.6	12.0	11.7	12.8	13.3
Mixed Xylenes	9.0	9.0	9.0	9.0	8.0	9.0	9.0	8.0	9.0	9.0	9.0	9.0
Paraxylene	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
MJA Jet	48.3	48.3	48.3	48.3	49.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Military Jet JP 8	22.3	23.2	23.2	23.0	23.0	22.5	22.3	23.2	23.0	22.9	22.5	22.3
Ultra LS Diesel	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
Light Cycle Oil	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Lubes	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6

	1	2	3	4	5	6	7	8	9	10	11	14
Waxes	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Low Sulfur No6 (CUA)	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.6	10.8
Slurry Oil	6.9	7.1	6.9	6.9	6.9	6.9	7.1	7.1	6.9	6.9	6.9	8.9
Pet Coke High Sulfur	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
P-P Mix(65 %)	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8
Propane	14.4	13.9	14.1	14.1	14.1	14.4	14.3	13.8	14.1	14.0	14.4	14.4
I-Butane	11.3	10.6	11.1	12.0	8.3	12.2	11.2	10.6	12.0	8.3	12.2	11.3
N-Butane	19.0	19.2	19.5	19.5	19.1	19.7	19.1	19.2	19.5	19.1	19.8	18.9
Fuel Gas	7.6	8.2	7.4	7.4	7.3	7.6	7.6	8.2	7.4	7.3	7.6	7.8
Net Offgas MCC, FOEB	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Cat Coke, 5 b/t	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Sulfur, 3.19 b/t	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
CAPACITY UTILIZATION												
Crude Unit A	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7
Crude Unit B	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7
Isom Prtr	23.1	35.4	35.3	35.5	35.5	35.8	23.3	35.4	35.5	34.7	35.8	35.5
Isom Reactor	13.1	16.3	16.3	16.3	16.3	16.3	13.2	16.3	16.3	16.1	16.3	16.2
Deisohexanizer	36.0	29.7	31.6	30.7	30.1	38.0	35.9	29.4	30.8	30.0	38.0	38.5
Prtr-3	47.6	49.1	49.1	49.1	49.1	48.7	47.3	49.1	49.1	49.1	48.7	47.8
CCR-3	75.0	71.2	74.9	73.4	72.4	75.0	75.0	71.8	73.5	72.3	75.0	75.0
Prtr-4	56.3	58.0	58.3	58.3	58.3	56.0	56.4	58.3	58.3	58.3	56.0	55.6
CCR-4	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
Udex	25.4	23.4	24.6	23.9	23.7	24.4	25.5	23.4	23.9	23.7	24.4	24.8
Toluene Recvy Cap	0.3	0.9	0.9	0.9	0.9	0.9	0.3	0.9	0.9	0.9	0.9	0.6
Benzene Recvy Cap	7.6	5.1	6.6	5.5	5.3	6.3	7.7	5.1	5.5	5.2	6.3	6.8
Udex Raffinate Cap	17.5	17.4	17.1	17.5	17.5	17.2	17.5	17.4	17.4	17.5	17.2	17.4
Benz + Toluene	7.9	6.0	7.4	6.4	8.2	7.2	8.0	8.0	6.4	8.2	7.2	7.4
Pygas Hydrotreater	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Paraxylene Cap	6.5	6.5	8.5	6.5	6.5	8.5	6.5	6.5	6.5	6.5	8.5	6.5
Hvy Ref Splitter	26.5	30.7	29.6	27.8	28.3	26.1	26.4	30.9	27.7	26.6	26.1	20.0
Mixed Xylene Recy	11.2	11.2	11.5	11.2	11.2	11.0	11.2	11.2	11.2	11.0	11.0	11.1
Rerun Twr Ovhd	1.5	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4	1.4	1.5
Rerun Twr Btms	9.8	9.8	10.0	9.8	9.8	9.8	9.7	9.8	9.8	9.7	9.6	9.7
No. 1 Debut Ovhd	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Bender (Trtr-3)	22.3	23.2	23.2	23.0	23.0	22.5	22.3	23.2	23.0	22.9	22.5	72.3
CHD-1 Kero	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Eff. CHD-1	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
CHD-2 LSD	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6
HDF	25.3	26.6	26.3	25.3	25.3	25.3	25.3	26.6	25.3	24.5	25.3	25.3
CHD-2 Splitter Tower	25.7	27.0	26.7	25.7	25.7	25.7	25.6	27.0	25.7	24.8	25.7	25.7
Eff CHD-2	47.3	48.7	48.4	47.3	47.3	47.3	47.5	48.7	47.4	46.5	47.3	47.3
FCCU	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
Wet Gas Cap(MSCF/D	78.3	78.2	78.3	78.3	78.3	78.3	78.2	78.2	78.3	76.3	78.3	78.3
High Pressure Cap(	60.8	60.9	60.8	60.8	60.8	60.8	60.9	60.9	60.8	60.8	60.8	60.8
SOX, lbs/hr	3.5	3.6	3.5	3.5	3.5	3.5	3.6	3.6	3.5	3.5	3.5	3.5
Cat Coke, mlbs/h	79.2	79.4	79.2	79.2	79.2	79.2	79.3	79.4	79.2	79.2	78.2	78.7
FCC Burn Air, mscf	198.0	196.0	196.0	198.0	196.0	196.0	198.0	186.0	196.0	186.0	186.0	196.0
FCC Gasoline Spl	53.2	52.8	53.2	53.2	53.2	53.2	52.8	52.8	53.2	53.2	53.7	53.2
GPSW PP Recovery	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Alkylate	15.4	15.5	15.4	14.0	19.7	14.0	15.3	15.5	14.0	19.7	14.0	15.4
MTBE	3.0	0.0	3.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0	0.0	3.0
Iso-Octene Unit	0.0	0.0	0.0	2.9	0.0	2.9	0.0	0.0	2.9	0.0	2.9	0.0
Hydrocracker	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
HDC Hyd Makeup	195.3	192.5	195.3	195.3	195.3	195.3	191.9	192.5	195.3	195.3	185.3	195.3
HDC Gasoline Draw	11.2	18.0	12.5	18.0	18.0	18.0	11.1	18.0	18.0	18.0	18.0	16.1
HDC Lt Naphtha Dra	31.2	29.7	31.5	27.6	28.5	25.5	31.1	29.4	27.5	28.7	25.5	28.3
HDC Kero Draw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coker	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
Coke, tons	2.6	2.6	2.8	2.6	2.6	2.8	2.6	2.6	2.6	2.8	2.6	2.6
Duotol	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Furfural Units	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Ketone One	3.5	2.9	2.9	2.9	3.5	2.9	2.9	2.8	3.5	2.9	2.9	3.5
Ketone Two	10.1	10.7	10.7	10.7	10.1	10.7	10.7	10.7	10.1	10.7	10.7	10.1
H2 Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold Box(MMSCFD)	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.7	35.2	35.2	35.2
Sulfur Plant	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ECONOMIC SUMMARY ANALYSIS												
PRODUCT SALES	8811.1	9503.5	9708.5	9653.3	9648.7	9731.6	9590.5	9599.5	9651.6	9615.8	9728.0	9518.4
FEEDSTOCK PURCHASES	4589.1	4652.9	4698.6	4650.8	4652.3	4756.8	4573.2	4658.9	4649.1	4620.0	4750.8	4500.8
GROSS MARGIN	5022.1	4940.6	5007.9	5002.4	4996.4	4974.9	5017.2	4940.6	5002.5	4995.8	4975.2	5017.6
NET UTILITY COSTS	490.6	481.6	503.0	501.6	503.8	496.2	484.7	481.4	501.5	504.0	496.2	497.7
NET OPERATING MARGIN	4531.5	4459.0	4504.0	4500.8	4492.6	4478.7	4532.6	4459.2	4501.1	4491.8	4479.0	4519.8

PIMS MODEL SOLUTION SUMMARY REPORT
ExxonMobil Beaumont Refinery
MODEL: MTBEPHASEOUT Study
2000 CoPlan Prices for 2004

	2005 w LSM Project Facilities	O2 Mandate, MTBE Banned	Sell Refinery MTBE	Build IsoOctene Unit	Alky Expansion	Iso-Octene Blend Value	No O2 Mandate, MTBE Allowed	No O2 Mandate, MTBE Banned	Build IsoOctene Unit	Alky Expansion	Iso-Octene Blend Value - No O2 Mandate	No Investment, O2 Mandate, Sell MTBE	No Investment, O2 Mandate, S/D MTBE Unit	Case 2 @ 0.3 Nat Gas	Case 4 @ 0.3 Nat Gas
O2 MANDATE	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	YES	YES	YES	YES
MTBE USED	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	NC
ETHANOL USED	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES
MTBE PLANT CONVERTED	NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO	NO	NO	NO	YES
CASE NO	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	24.0	25.0	26.0
OBJ FUNC, k$/D	4509.5	4444.3	4496.0	4479.7	4471.5	4457.6	4511.9	4458.2	4486.6	4480.3	4454.4	4491.8	4450.7	4435.5	4472.1
OBJ FUNC, M$/Yr	1645.0	1622.2	1641.0	1635.1	1632.1	1627.0	1645.9	1627.2	1637.6	1635.3	1625.8	1639.5	1624.5	1619.0	1632.3
Delta OBJ FUNC, M$/Yr	BASE	-23.8													
Delta OBJ FUNC, M$/Yr		Base		12.9											
Delta OBJ FUNC, M$/Yr		Base			9.9										
Delta OBJ FUNC, M$/Yr								Base	10.4						
Delta OBJ FUNC, M$/Yr								Base		8.1					
Refy MTBE BEV($/Bbl)			13.1												
IsoOctene BEV($/Bbl)						29.8					27.5				
RFG Incentive($/Bbl)															
Super		-0.47	-1.09	-0.79	-0.69	-0.67									
Regular	0.75	0.29		0.58	0.70	0.40	0.64	0.19	3.38		0.77				
Crude/Cat Rates															
Total Crude	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	353.4	363.4	363.4	363.4	363.4	363.4	363.4
FCC	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
MTBE(Pure)	2.7	0.0	2.8	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0
Iso-Octene	0.0	0.0	0.0	2.6	0.0	2.6	0.0	0.0	2.6	0.0	2.6	0.0	0.0	0.0	2.6
Alky	14.5	15.5	14.9	13.3	18.5	13.3	14.6	15.5	13.3	18.5	13.3	14.6	15.5	15.5	13.5
Gasolines Sold															
Conv NE SUL (9 #)	73.0	11.8	26.9	31.2	25.3	56.8	69.6	38.4	56.3	44.2	56.8	54.3	48.0	15.1	34.4
Conv SW SUL(7.6 #)	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL (9 #)	20.8	99.3	84.5	78.6	88.1	52.3	21.0	93.0	72.3	88.2	62.9	85.5	103.1	88.4	67.0
Conv SW RUL(7.8 #)	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Total Conventional	151.0	168.3	168.6	167.0	170.5	166.2	147.8	188.6	185.7	189.6	176.9	197.0	208.3	158.7	158.6
Refm SW SUL	31.2	25.0	25.0	25.0	25.0	25.0	35.2	0.0	0.1	0.0	12.3	0.0	0.0	25.0	25.0
Refm SW RUL	22.5	22.5	18.6	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	0.0	0.0	22.5	22.5
Total RFG	53.7	47.5	43.6	47.5	47.5	47.5	57.7	22.5	22.6	22.5	34.8	0.0	0.0	47.5	47.5
TOTAL MOGAS	204.7	215.8	212.2	214.5	218.0	213.7	205.5	211.1	208.3	212.1	211.8	197.0	208.3	206.2	206.1
% Super	58.1%	23.9%	31.4%	33.1%	29.8%	45.1%	58.1%	25.1%	34.1%	27.7%	39.6%	35.0%	30.1%	26.5%	35.9%
IC4= to Fuel		1.1						1.5							
IC4 Sales	10.7	9.5	10.6	11.3	8.1	11.5	10.8	9.9	11.5	8.3	11.6	10.8	10.0	9.4	11.3
Sulfuric Acid, ST/D	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FEEDSTOCK PURCHASES															
==================															
Cusiana - 4320954	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2
Maya 4321133	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.6	108.5	108.5	108.5	108.5	108.5
Oso 4920166	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Olmeca 4018951	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7

Nat Gasoline from WT	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
MCC B+B Mix	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Whart Natural Gasoli	0.3	12.0	12.0	12.2	12.1	9.8	0.4	12.1	12.5	12.2	12.5	4.2	12.5	0.3	0.3
Methanol	0.9	0.0	1.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
Ethanol	0.0	2.6	2.4	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6
MTBE	11.0	0.0	0.0	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Purchased Pygas	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Iso-Octene	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0
Purchased Hvy Naphth	2.5	8.9	8.7	7.8	8.4	5.4	2.6	8.2	4.8	6.9	4.3	3.2	4.4	9.6	9.6
Purchased VGO	30.4	30.4	27.3	30.8	30.3	30.8	30.8	30.4	30.8	30.2	30.2	30.8	30.4	29.7	28.6
UTILITY PURCHASES															
Hydrogen (H) from A	19.4	22.1	21.1	24.3	25.0	21.9	22.0	19.4	21.9	21.6	21.4	21.8	19.3	22.4	24.2
Fuel Gas foeb	21.6	21.2	22.5	22.3	22.1	22.0	21.7	20.9	22.1	22.0	22.1	21.9	20.7	20.7	21.8
Power kwh	111.5	111.2	113.6	123.8	110.7	126.5	112.0	116.2	128.0	117.2	128.3	113.5	116.1	104.1	116.0
Cat/Chem US $	52.8	52.3	52.6	52.2	52.6	52.2	52.9	52.5	52.3	52.8	52.3	62.9	52.4	52.1	51.9
ZSM-5 US $/to	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FCC Cat US $/ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk Acid ton	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.1
G&D Addt US $	9.4	9.8	9.6	9.8	9.8	5.7	9.4	9.7	9.6	9.6	9.6	8.3	9.5	9.7	9.6
PRODUCT SALES															
Conv NE SUL	73.0	11.8	26.9	31.2	25.3	56.8	69.6	38.4	56.3	44.2	56.8	54.3	48.0	15.1	34.4
Conv SW SUL	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL	20.6	99.3	84.5	78.6	88.1	52.3	21.0	93.0	72.3	88.2	62.9	85.5	103.1	86.4	67.0
Conv SW RUL	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Refm SW SUL	31.2	25.0	25.0	25.0	25.0	25.0	35.2	0.0	0.1	0.0	12.3	0.0	0.0	25.0	25.0
Refm SW RUL	22.5	22.5	18.6	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	0.0	0.0	22.5	22.5
Refinery MTBE	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0
Benzene	14.2	11.8	12.2	11.9	11.7	12.6	14.2	12.9	12.7	13.4	13.0	13.8	12.8	11.6	11.7
Mixed Xylenes	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Paraxylene	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
MJA Jet	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Military Jet JP-8	22.2	23.2	23.1	23.0	23.1	22.7	22.3	23.1	22.6	22.9	22.5	22.3	22.5	23.2	23.2
Ultra LS Diesel	21.4	21.4	18.1	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	19.7
Light Cycle Oil	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Lubes	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Waxes	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Low Sulfur No6 (CUA)	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8
Slurry Oil	7.1	7.1	6.4	6.9	6.9	6.9	6.9	7.1	6.9	6.9	6.9	6.9	7.1	7.1	6.7
Pet Coke High Sulfur	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.8	12.9	12.9	12.9
P-P Mix(65 %)	17.8	17.8	17.7	17.8	17.8	17.8	17.8	17.6	17.8	17.8	17.8	17.8	17.8	17.8	17.7
Propane	14.6	14.2	14.4	14.3	14.2	14.6	14.7	14.4	14.6	14.5	14.7	14.6	14.6	14.0	14.2
I-Butane	10.7	9.5	10.6	11.3	8.1	11.5	10.8	9.9	11.5	8.3	11.5	10.8	10.0	9.4	11.3
N-Butane	17.2	17.6	17.8	17.9	17.5	17.6	17.4	16.7	17.2	16.8	17.5	15.4	16.3	16.0	16.2
Fuel Gas	9.2	9.7	8.9	8.9	8.6	9.1	9.2	10.1	9.2	8.1	9.2	9.2	10.2	9.6	8.8
Net Offgas MCC, FOEB	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.9	2.9	2.9	2.9
Cat Coke, 5 b/t	4.8	4.8	4.7	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.7
Sulfur, 3.19 b/t	1.6	1.6	1.5	1.6	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
CAPACITY UTILIZATION															
Crude Unit A	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7
Crude Unit B	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7
Isom Prtr	23.5	35.4	35.3	35.5	35.5	33.0	23.5	35.4	35.7	35.5	35.7	27.4	35.7	23.7	23.7
Isom Reactor	13.2	16.3	16.3	16.3	16.3	15.6	13.2	16.3	16.3	16.3	16.3	14.2	16.3	13.4	13.4
Deisohexanizer	36.0	29.9	31.0	30.3	29.7	34.2	36.0	31.5	35.5	33.6	36.1	36.5	35.6	29.4	29.4
Prtr-3	47.3	49.1	49.1	49.1	49.1	49.1	47.4	49.1	49.0	49.1	48.1	47.9	48.8	49.1	49.1
CCR-3	75.0	72.4	73.7	72.8	71.9	75.0	75.0	74.9	75.0	75.0	75.0	75.0	75.0	71.6	71.5
Prtr-4	56.3	58.3	58.3	58.3	58.3	56.9	56.4	58.3	58.2	57.2	56.2	55.9	56.2	58.3	58.3
CCR-4	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0

Udex	25.5	23.6	24.0	23.8	23.6	24.3	25.5	24.6	24.4	24.9	24.6	25.2	24.4	23.4	23.5
Toluene Recvy Cap	0.3	0.9	0.9	0.9	0.9	0.9	0.3	0.9	0.8	0.9	0.9	0.7	0.8	0.8	0.9
Benzene Recvy Cap	7.7	5.3	5.7	5.4	5.2	6.1	7.7	6.4	6.2	6.9	6.6	7.3	6.3	5.1	5.2
Udex Raffinate Cap	17.5	17.4	17.4	17.5	17.5	17.3	17.5	17.3	17.2	17.2	17.2	17.2	17.2	17.4	17.4
Benz + Toluene	8.0	6.2	6.6	6.3	6.1	7.0	8.0	7.3	7.1	7.8	7.4	6.0	7.2	6.0	6.1
Pygas Hydrotreater	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Paraxylene Cap	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Hvy Ref Splitter	26.4	28.9	27.6	28.1	28.6	26.7	26.4	27.3	28.3	26.6	25.8	25.9	26.2	32.0	29.4
Mixed Xylene Recy	11.2	11.3	11.3	11.2	11.1	11.0	11.2	11.4	11.0	11.2	11.1	11.1	11.0	11.1	11.2
Rerun Twr Ovhd	1.6	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.5	1.4	1.5	1.4	1.4	1.4
Rerun Twr Btms	9.7	9.9	9.9	9.8	9.7	9.6	9.7	10.0	9.6	9.7	9.6	9.6	9.6	9.8	9.8
No. 1 Debut Ovhd	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Bender (Trt-3)	22.2	23.2	23.1	23.0	23.1	22.7	22.3	23.1	22.6	22.9	22.5	22.3	22.5	23.2	23.2
CHD-1 Kero	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Eff. CHD-1	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
CHD-2 LSD	21.6	21.6	18.3	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	20.0
HDF	25.3	26.2	25.4	25.3	25.3	24.9	25.3	25.8	25.3	25.3	25.3	25.3	25.3	26.5	26.8
CHD-2 Splitter Tower	25.6	26.6	25.7	25.7	25.7	25.2	25.7	26.2	25.7	25.6	25.7	25.7	25.6	26.8	27.0
Eff CHD-2	47.3	48.3	44.0	47.3	47.4	46.9	47.3	47.9	47.3	47.3	47.4	47.3	47.3	48.5	47.0
FCCU	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
Wet Gas Cap(MSCF/D	78.2	78.2	78.7	78.3	78.4	78.3	78.3	78.2	78.3	78.4	78.4	78.3	78.2	78.2	78.5
High Pressure Cap(	60.9	60.9	61.0	60.8	60.9	60.8	60.8	60.9	60.8	60.8	60.9	60.8	60.9	60.9	60.9
SOX, lbs/hr	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.6	3.5	3.5	3.5	3.5	3.6	3.6	3.5
Cat Coke, mlbs/h	79.4	79.4	78.9	79.2	79.2	79.2	78.2	79.4	79.2	79.2	79.2	79.2	79.4	79.3	79.1
FCC Burn Air, mscf	196.0	196.0	196.0	196.0	196.0	195.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0
FCC Gasoline Splt	52.8	52.8	53.9	53.2	53.3	53.2	53.2	52.8	53.2	53.3	53.3	53.2	52.8	52.8	53.6
GPSW PP Recovery	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Alkylate	14.5	15.5	14.9	13.3	18.5	13.3	14.6	15.5	13.3	18.5	13.3	14.6	15.5	15.5	13.5
MTBE	2.7	0.0	2.8	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0
Iso-Octene Unit	0.0	0.0	0.0	2.6	0.0	2.6	0.0	0.0	2.6	0.0	2.6	0.0	0.0	0.0	2.8
Hydrocracker	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
HDC Hyd Makeup	192.5	192.5	193.9	195.3	195.1	195.3	195.3	192.5	195.3	195.1	195.1	195.3	192.5	191.7	194.5
HDC Gasoline Draw	11.1	18.0	17.1	18.0	18.0	18.0	11.2	14.4	18.0	12.9	17.3	13.1	18.0	18.0	18.0
HDC Lt Naphtha Dra	31.1	28.6	28.1	28.1	29.1	26.0	31.1	29.7	25.8	31.1	25.7	29.6	25.6	29.4	29.5
HDC Kero Draw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coker	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
Coke, tons	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Duosol	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Furfural Units	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Ketone One	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.5	3.5	2.9	2.9
Ketone Two	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.1	10.1	10.7	10.7
H2 Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold Box(MMSCFD)	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
Sulfur Plant	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

ECONOMIC SUMMARY ANALYSIS
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PRODUCT SALES	9532.6	9553.4	9571.2	9595.1	9592.1	9645.2	9556.9	9471.5	9467.2	9489.8	9588.4	9304.5	9395.2	9323.6	9360.6
FEEDSTOCK PURCHASES	4562.4	4650.4	4600.1	4638.4	4641.4	4717.5	4579.5	4562.7	4509.8	4536.1	4662.2	4344.8	4497.0	4436.6	4419.3
GROSS MARGIN	4970.2	4903.0	4971.1	4956.8	4950.7	4927.6	4977.5	4908.7	4957.4	4953.6	4924.2	4959.7	4898.2	4887.0	4941.2
NET UTILITY COSTS	460.7	458.7	475.1	477.1	479.3	470.1	465.5	450.5	470.7	473.3	469.8	467.8	447.5	451.4	469.1
NET OPERATING MARGIN	4509.5	4444.3	4496.0	4479.7	4471.5	4457.6	4511.9	4458.2	4486.6	4480.3	4454.4	4491.8	4450.7	4435.5	4472.1

PIMS MODEL SOLUTION SUMMARY REPORT
ExxonMobil Beaumont Refinery
MODEL: MTBEPHASEOUT Study
2000 CoPlan Prices for 2004

50 $/01B

	2005 w LSM Project Facilities	O2 Mandate, MTBE Banned	Sell Refinery MTBE	Build IsoOctene Unit	Alky Expansion	Iso-Octene Blend Value	No O2 Mandate, MTBE Allowed	No O2 Mandate, MTBE Banned	Build IsoOctene Unit	Alky Expansion	Iso-Octene Blend Value - No O2 Mandate
O2 MANDATE	YES	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO
MTBE USED	YES	NO	NO	NO	NO	NO	YES	NO	NO	NO	NO
ETHANOL USED	NO	YES	YES	YES	YES	YES	NO	NO	NO	NO	NO
MTBE PLANT CONVERTED	NO	NO	NO	YES	NO	YES	NO	NO	YES	NO	NO
CASE NO.	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0
OBJ FUNC, K$/D	4539.5	4456.6	4514.8	4495.9	4484.8	4482.7	4544.1	4472.1	4504.0	4494.4	4476.0
OBJ FUNC, M$/Yr	1656.9	1626.7	1647.9	1641.0	1637.0	1636.2	1658.6	1632.3	1644.0	1640.4	1633.7
Delta OBJ FUNC, M$/Yr	BASE	-30.2									
Delta OBJ FUNC, M$/Yr		Base		14.4							
Delta OBJ FUNC, M$/Yr		Base			10.3						
Delta OBJ FUNC, M$/Yr								Base	11.7		
Delta OBJ FUNC, M$/Yr								Base		8.1	
Rely MTBE BEV($/Bbl)			11.8								
IsoOctene BEV($/Bbl)						31.4					28.4
RFG Incentive($/Bbl)											
Super	0.01	-1.15	-0.36	-1.40	-1.43	-0.35	0.26	-0.12			
Regular	0.61	0.08		1.60	1.47	0.50	0.78		0.10	0.20	0.48
Crude/Cat Rates											
Total Crude	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4	363.4
FCC	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
MTBE(Pure)	2.7	0.0	2.8	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0
Iso-Octene	0.0	0.0	0.0	2.6	0.0	2.6	0.0	0.0	2.6	0.0	2.6
Alky	14.5	15.5	15.2	13.3	18.5	13.3	14.5	15.5	13.3	18.5	13.3
Gasolines Sold											
Conv NE SUL (9 #)	79.6	14.3	29.2	32.1	27.8	57.3	76.4	44.4	56.3	45.5	57.6
Conv SW SUL(7.8 #)	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL (9 #)	12.0	95.8	81.0	76.2	81.9	51.1	14.0	88.6	72.3	87.1	62.2
Conv SW RUL(7.8 #)	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Total Conventional	149.0	167.3	167.3	165.5	166.8	165.6	147.5	190.2	185.8	189.8	177.0
Refm SW SUL	37.5	25.0	25.0	25.0	25.0	25.0	37.5	0.0	0.0	0.0	12.3
Refm SW RUL	22.5	22.5	20.5	22.5	22.5	22.5	22.5	21.0	22.5	22.5	22.5
Total RFG	60.0	47.5	45.5	47.5	47.5	47.5	60.0	21.0	22.5	22.5	34.8
TOTAL MOGAS	209.0	214.8	212.9	213.0	214.3	213.1	207.5	211.2	208.3	212.3	211.7
% Super	63.2%	25.1%	32.3%	33.7%	31.5%	45.5%	61.9%	28.0%	34.1%	28.4%	39.9%
IC4= to Fuel		1.2						1.5			
IC4 Sales	10.7	9.5	10.7	11.3	8.0	11.5	10.7	9.9	11.5	8.3	11.6
Sulfuric Acid, ST/D	0	0	0	0	0	0	0	0	0	0	0
FEEDSTOCK PURCHASES											
==================											
Cusiana - 4320954	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2
Maya 4321133	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5	108.5
Oso 4920166	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Olmeca 4018951	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7

C:\AspenTech Models\MTBEPHASEOUT\MTBEPhaseoutsummary.xls

Nat Gasoline from WT	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
MCC B=B Mix	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wharf Natural Gasol	0.0	11.6	12.2	11.0	10.3	9.6	0.2	12.1	12.5	12.2	12.5
Methanol	0.9	0.0	1.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0
Ethanol	0.0	2.6	2.5	2.6	2.6	2.6	0.0	0.0	0.0	0.0	0.0
MTBE	15.5	0.0	0.0	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0
Purchased Pygas	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Iso-Octene	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	5.0
Purchased Hvy Naphth	2.5	7.9	8.0	7.1	5.3	4.9	2.5	7.6	4.8	7.0	4.3
Purchased VGO	30.4	30.4	23.7	30.7	30.3	30.8	30.4	30.4	30.8	30.2	30.2
UTILITY PURCHASES											
================											
Hydrogen (HI) from A	19.4	23.2	18.8	24.7	26.2	22.0	19.4	19.5	21.9	21.5	21.3
Fuel Gas foeb	21.6	21.2	22.5	22.2	22.1	22.0	21.6	20.9	22.1	22.0	22.1
Power kwh	111.3	109.3	113.3	122.6	108.3	126.3	111.4	115.4	128.0	117.0	128.2
Cat/Chem US $	52.8	52.2	52.2	52.1	52.4	52.2	52.8	52.4	52.3	52.8	52.3
ZSM-5 US $/to	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FCC Cat US $/ton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alk Acid ton	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.0
G&D Addt US $	9.5	9.8	9.5	9.7	9.6	9.7	9.5	9.7	9.6	9.6	9.6
PRODUCT SALES											
=============											
Conv NE SUL	79.8	14.3	29.2	32.1	27.8	57.3	76.4	44.4	56.3	45.5	57.6
Conv SW SUL	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Conv NE RUL	12.0	95.8	81.0	76.2	81.9	51.1	14.0	88.6	72.3	87.1	62.2
Conv SW RUL	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5
Refm SW SUL	37.5	25.0	25.0	25.0	25.0	25.0	37.5	0.0	0.0	0.0	12.3
Refm SW RUL	22.5	22.5	20.5	22.5	22.5	22.5	22.5	21.0	22.5	22.5	22.5
Refinery MTBE	0.0	0.0	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benzene	14.2	11.6	12.1	11.8	11.6	12.5	14.2	12.3	12.7	13.2	13.0
Mixed Xylenes	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Paraxylene	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
MJA Jet	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Military Jet JP-8	22.2	23.0	23.0	22.9	22.6	22.6	22.2	23.0	22.6	22.9	22.5
Ultra LS Diesel	21.4	21.4	13.6	21.4	21.1	21.4	21.4	21.4	21.4	21.4	21.4
Light Cycle Oil	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Lubes	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6
Waxes	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Low Sulfur No6 (CUA)	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8	10.8
Slurry Oil	7.1	7.1	5.9	6.9	6.9	6.9	7.1	7.1	6.9	6.9	6.9
Pet Coke High Sulfur	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9
P-P Mix(65 %)	17.8	17.8	17.6	17.8	17.8	17.8	17.8	17.8	17.8	17.8	17.8
Propane	14.6	14.1	14.5	14.2	14.1	14.6	14.6	14.4	14.6	14.5	14.7
I-Butane	10.7	9.5	10.7	11.3	8.0	11.5	10.7	9.9	11.5	8.3	11.6
N-Butane	17.1	17.5	17.9	17.8	17.4	17.7	17.2	16.6	17.2	16.8	17.5
Fuel Gas	9.2	9.7	8.9	8.9	8.7	9.1	9.2	10.1	9.2	9.1	9.2
Net Offgas MCC, FOEB	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Cat Coke, 5 b/t	4.8	4.8	4.7	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Sulfur, 3.19 b/lt	1.6	1.6	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
CAPACITY UTILIZATION											
====================											
Crude Unit A	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7	131.7
Crude Unit B	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7	231.7
Isom Prtr	23.1	34.9	35.5	34.3	33.4	32.8	23.3	35.5	35.7	35.5	35.7
Isom Reactor	13.1	16.1	16.3	16.0	15.7	15.6	13.2	16.3	16.3	16.3	16.3
Deisohexanizer	35.8	29.4	31.2	30.2	29.4	34.2	35.9	31.6	35.5	33.5	36.2
Prtr-3	47.3	49.1	49.1	49.1	49.1	49.1	47.3	49.1	49.0	49.1	48.0
CCR-3	75.0	71.6	74.0	72.6	71.5	75.0	75.0	74.8	75.0	75.0	75.0
Prtr-4	56.4	58.3	58.3	58.3	58.3	56.9	56.4	58.3	56.2	57.2	56.2

CCR-4	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0	85.0
Udex	25.5	23.6	24.0	23.7	23.5	24.2	25.5	24.1	24.4	24.8	24.6
Toluene Recvy Cap	0.3	0.9	0.9	0.9	0.9	0.9	0.3	0.9	0.9	0.9	0.9
Benzene Recvy Cap	7.7	5.1	5.6	5.3	5.1	6.1	7.7	5.8	6.3	6.7	6.5
Udex Raffinate Cap	17.5	17.5	17.5	17.5	17.5	17.3	17.5	17.4	17.2	17.2	17.2
Benz + Toluene	8.0	6.1	6.5	6.3	6.0	7.0	8.0	6.7	7.1	7.6	7.4
Pygas Hydrotreater	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Paraxylene Cap	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Hvy Ref Splitter	26.4	28.8	27.3	28.4	29.5	26.8	26.4	27.0	26.3	26.6	25.7
Mixed Xylene Recy	11.2	11.1	11.2	11.1	10.8	11.0	11.2	11.3	11.0	11.2	11.1
Rerun Twr Ovhc	1.6	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.5	1.4
Rerun Twr Btms	9.7	9.7	9.9	9.7	9.4	9.6	9.7	9.9	9.6	9.7	9.6
No * Debut Ovhd	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Bender (Tnr-3)	22.2	23.0	23.0	22.9	22.6	22.6	22.2	23.0	22.6	22.9	22.5
CHD-1 Kero	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
Eff. CHD-1	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
CHD-2 LSD	21.6	21.6	13.7	21.6	21.4	21.6	21.6	21.6	21.6	21.6	21.6
HDF	25.3	25.3	25.4	24.7	23.0	24.5	25.3	25.3	25.3	25.3	25.3
CHD-2 Splitter Tower	25.6	25.7	25.8	25.1	23.3	24.8	25.6	25.6	25.7	25.6	25.7
Eff CHD-2	47.3	47.4	39.5	46.7	44.7	46.5	47.3	47.3	47.3	47.3	47.4
FCCU	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
Wet Gas Cap(MSCF/D	78.2	78.2	79.1	78.3	78.4	78.3	78.2	78.2	78.3	78.4	78.4
High Pressure Cap(	60.9	60.9	61.1	60.8	60.9	60.8	60.9	60.9	60.8	60.9	60.9
SOX, lbs/hr	3.6	3.6	3.4	3.5	3.5	3.5	3.6	3.6	3.5	3.5	3.5
Cat Coke, mlbs/h	79.4	79.4	78.6	79.2	79.2	79.2	79.4	79.4	79.2	79.2	79.2
FCC Burn Air, mscf	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0	196.0
FCC Gasoline Split	52.8	52.8	54.5	53.2	53.3	53.2	52.8	52.8	53.2	53.3	53.3
GP5W PP Recovery	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Alkylate	14.5	15.5	15.2	13.3	18.5	13.3	14.5	15.5	13.3	18.5	13.3
MTBE	2.7	0.0	2.8	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0
Iso-Octene Unit	0.0	0.0	0.0	2.6	0.0	2.6	0.0	0.0	2.6	0.0	2.6
Hydrocracker	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0	65.0
HDC Hyd Makeup	192.5	192.5	192.4	195.3	195.1	195.3	192.5	192.5	195.3	195.1	195.1
HDC Gasoline Draw	11.1	18.0	18.0	18.0	18.0	18.0	11.1	18.0	18.0	14.0	17.7
HDC Lt Naphtha Dra	31.1	29.4	26.8	28.4	29.4	26.0	31.1	26.1	25.9	30.0	25.2
HDC Kero Draw	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coker	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
Coke, tons	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Duosol	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Furfural Units	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Ketone One	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Ketone Two	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
H2 Plant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cold Box(MMSCFD)	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2
Sulfur Plant	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ECONOMIC SUMMARY ANALYSIS											
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PRODUCT SALES	9685.9	9538.1	9514.4	9576.0	9511.1	9656.9	9649.0	9473.2	9484.4	9504.7	9606.5
FEEDSTOCK PURCHASES	4685.9	4622.2	4528.4	4603.0	4546.3	4704.0	4644.3	4551.3	4509.7	4537.3	4660.8
GROSS MARGIN	5000.0	4915.9	4986.0	4972.9	4964.8	4952.9	5004.7	4921.9	4974.8	4967.4	4945.7
NET UTILITY COSTS	460.5	459.3	471.2	477.0	480.0	470.1	460.6	449.8	470.7	473.0	469.7
NET OPERATING MARGIN	4539.5	4456.6	4514.8	4495.9	4484.8	4482.7	4544.1	4472.1	4504.0	4494.4	4476.0

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	Oxygenate Mandate			Ethanol						No Oxygenate Mandate			
	Base	No MTBE-R Sales No RFG No Invest.	MTBE-R Sales No RFG No Invest.	No MTBE-R Sales EtOH Only		MTBE-R Sales EtOH Only	Isooctene		Plus Alky	No MTBE-R Sales No Invest.	MTBE-R Sales No Invest.	Isooctene	Plus Alky
ObjFn, k$/D	4510	4451	4492	4444	4036	4496	4480	4472	4471	4458		4487	4480
Crude, kBD	363	363	363	363	363	363	363	363	363	363		363	363
Cats, kBD	112	112	112	112	112	112	112	112	112	112		112	112
Mogas, kBD	205	208	197	216	206	212	215	206	218	211		209	212
%RFG	26.3	0.0	0.0	22.2	23	20.8	22.3	23	22.0	10.9	#DIV/0!	11.0	10.8
%UP	58.0	30.3	35.0	23.6	27	31.1	33.0	36	29.8	25.1	#DIV/0!	34.0	27.8
RFG-UR, kBD	23	0	0	23	22	19	23	23	23	23		23	23
RFG-UP, kBD	31	0	0	25	25	25	25	25	25	0		0	0
CONV-UR, kBD	63	145	128	142	129	127	121	109	130	135		115	130
CONV-UP, kBD	88	63	69	26	30	41	46	49	40	53		71	59
Total Clean Prod, kBD													
MTBE-Ref, kBD	3	0	3	0	0	3	0	0	0	0		0	0
MTBE-Chem, kBD	0	0	0	0	0	0	0	0	0	0		0	0
MTBE-Purchase, kBD	11	0	0	0	0	0	0	0	0	0		0	0
MTBE-Sales, kBD	0	0	3	0	0	3	0	0	0	0		0	0
iC4= to Fuel, kBD	0	0	0	1.1	0	0	0	0	0	1.5		0	0
Ethanol, kBD	0	0	0	2.6	2.6	2.4	2.6	2.6	2.6	0		0	0
Isooctene, kBD	0	0	0	0	0	0	2.6	2.6	0	0		2.6	0
C5's to BOP, kBD													
Raffin8 to mogas, kBD													
Investment, $M													
Net Cash Margin, $M/Y													
vs Base													
vs No Investment													

Beaumont

	Oxygenate Mandate			Ethanol				No Oxygenate Mandate			
	Base	No MTBE-R Sales No RFG No Invest.	MTBE-R Sales No RFG No Invest.	No MTBE-R Sales EtOH Only	MTBE-R Sales EtOH Only	Isooctene	Plus Alky	No MTBE-R Sales No Invest.	MTBE-R Sales No Invest.	Isooctene	Plus Alky
ObjFn, k$/D	4510	4451	4492	4444	4496	4480-	4471	4458		4487	4480
Crude, kBD	363	363	363	363	363	363	363	363		363	363
Cats, kBD	112	112	112	112	112	112	112	112		112	112
Mogas, kBD	205	208	197	216	212	215	218	211		209	212
%RFG	26.3	0.0	0.0	22.2	20.8	22.3	22.0	10.9	#DIV/0!	11.0	10.8
%UP	58.0	30.3	35.0	23.6	31.1	33.0	29.8	25.1	#DIV/0!	34.0	27.8
RFG-UR, kBD	23	0	0	23	19	23	23	23		23	23
RFG-UP, kBD	31	0	0	25	25	25	25	0		0	0
CONV-UR, kBD	63	145	128	142	127	121	130	135		115	130
CONV-UF, kBD	88	63	69	26	41	46	40	53		71	59
Total Clean Prod, kBD											
MTBE-Ref, kBD	3	0	3	0	3	0	0	0		0	0
MTBE-Chem, kBD	0	0	0	0	0	0	0	0		0	0
MTBE-Purchase, kBD	11	0	0	0	0	0	0	0		0	0
MTBE-Sales, kBD	0	0	3	0	3	0	0	0		0	0
iC4= to Fuel, kBD	0	0	0	1.1	0	0	0	1.5		0	0
Ethanol, kBD	0	0	0	2.6	2.4	2.6	2.6	0		0	0
Isooctene, kBD	0	0	0	0	0	2.6	0	0		2.6	0
C5's to BOP, kBD											
Raffin8 to mogas, kBD											
Investment, $M											
Net Cash Margin, $M/Y											
vs Base											
vs No Investment											

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#-5 KBD Alky 8

	Oxygenate Mandate							No Oxygenate Mandate			
		No MTBE-R Sales No RFG	MTBE-R Sales No RFG	Ethanol No MTBE-R Sales	MTBE-R Sales			No MTBE-R Sales	MTBE-R Sales		
	Base	No Invest.	No Invest.	EtOH Only	EtOH Only	Isooctene	Plus Alky	No Invest.	No Invest.	Isooctene	Plus Alky
ObjFn, kS/D	4510	4451	4492	4444	4496	4480	4471	4458		4487	4480
Crude, kBD	363	363	363	363	363	363	363	363		363	363
Cats, kBD	112	112	112	112	112	112	112	112		112	112
Mogas, kBD	205	208	197	216	212	215	218	211		209	212
%RFG		0	0								
%UP											
RFG-UR, kBD	23	0	0	23	17	23	23	23		23	23
RFG-UP, kBD	31	0	0	25	25	25	25	0		0	0
CONV-UR, kBD	63	145	128	142	127	121	130	136		115	130
CONV-UP, kBD	88	63	69	26	41	46	40	53		71	59
Total Clean Prod, kBD											
MTBE-Ref, kBD	3	0	3	0	3	0	0	0		0	0
MTBE-Chem, kBD	0	0	0	0	0	0	0	0		0	0
MTBE-Purchase, kBD	11	0	0	0	0	0	0	0		0	0
MTBE-Sales, kBD	0	0	3	0	3	0	0	0		0	0
iC4= to Fuel, kBD	0	0									
Ethanol, kBD	0	0	0	1.1	0	0	0	1.5		0	0
Isooctene, kBD	0	0	0	2.6	2.4	2.6	2.6	0		0	0
C5's to BOP, kBD			0	0	0	2.6	0	0		2.6	0
Raffin8 to mogas, kBD											
Investment, $M											
Net Cash Margin, $M/Y											
vs Base											
vs No Investment											

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	Oxygenate Mandate			Ethanol				No Oxygenate Mandate			
	Base	No MTBE-R Sales No RFG No Invest.	MTBE-R Sales No RFG No Invest.	No MTBE-R Sales EtOH Only	MTBE-R Sales EtOH Only	Isooctene	Plus Alky	No MTBE-R Sales No Invest.	MTBE-R Sales No Invest.	Isooctene	Plus Alky
ObjFn, k$/D	4570			4459	4505	4501	4493				
Crude, kBD	363			363	363	363	363				
Cats, kBD	112			112	112	112	112				
Mogas, kBD	205			216	213	215	219				
%RFG											
%UP	59			25	28	35	31				
RFG-UR, kBD	23			23	23	23	23				
RFG-UP, kBD	37			25	25	25	25				
CONV-UR, kBD	63			140	131	118	128				
CONV-UP, kBD	88			28	34	49	43				
Total Clean Prod, kBD											
MTBE-Ref, kBD	3			–	3	–	–				
MTBE-Chem, kBD	–			–	–	–	–				
MTBE-Purchase, kBD	11			–	–	–	–				
MTBE-Sales, kBD	–			–	3	–	–				
iC4= to Fuel, kBD	–			–	–	–	–				
Ethanol, kBD	–			1.4	–	–	–				
Isooctene, kBD	–			2.6	2.6	2.6	2.6				
C5's to BOP, kBD				–	–	2.9	–				
Raffin8 to mogas, kBD											
Investment, $M											
Net Cash Margin, $M/Y											
vs Base											
vs No Investment											

Δ 5.7

- Refining MTBE sales questionable due to ~~poor~~ poorer quality
- UP production can be increased via iC8= purchase (B/E value —) or BTX?
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